renal function is evaluated on the basis of the renal cleatinine clearance (CLcr) calculated from the concentration of creatinine in serum, but according to this invention, the indicator of renal functional condition is not limited to the renal clearance of creatinine but may include the renal clearance of any other suitable substance.

[44] Description will be given about how the dose of a drug is adjusted using an inventive system, taking as an example a case where the drug is ciprofloxacin (CPFX).

[45] 1) Generally, following guidelines are provided with the renal creatinine clearance (CLcr) as a marker.

$CLcr \geq 61$, 300 mg for single dose at 12 hr interval

$31 \leq CLcr \leq 60$, 300 mg for single dose at 12-24 hr interval

$CLcr \leq 30$, 300 mg for single dose at 24-48 hr interval

[46] 2) When the renal clearance (CLr) of CPFX is used as a marker, following guidelines will be obtained from equations (1) and (13).

$CLcr \geq 61 \times k$, 300 mg for single dose at 12 hr interval

$31 \times k \leq CLcr \leq 60 \times k$, 300 mg for single dose at 12-24 hr interval

$CLcr \leq 30 \times k$, 300 mg for single dose at 24-48 hr interval

[47] 3) If the drug is to be administered during CHF, its dose will be adjusted by the above-mentioned 2) and equation (15) as follows.

$k \times CLcr + (1-T/100) \times Qw \times (1-f/100) + CLa \geq 61 \times k$

300 mg for single dose at 12 hr interval

$31 \times k \leq k \times CLcr + (1-T/100) \times Qw \times (1-f/100) + CLa \leq 60 \times k$

300 mg for single dose at 12-24 hr interval

$k \times CLcr + (1-T/100) \times Qw \times (1-f/100) + CLa \leq 30 \times k$

300 mg for single dose at 24-48 hr interval

[48] For CPFX, k is 0.8, T is 20-30%, Qw is a value set for CHF (usually 5-15 ml/min), and CLcr is calculated from the concentration of creatinine in serum by equation (16). The guidelines shown in the screen of Fig. 5 have been obtained in the manner as described above.

[49] If the user clicks the button 23a for the support of drug administration on the drug selection screen 23, the system will present the drug administration support display screen 24 as shown in Fig. 5 which carries the data of total clearance level. In the screen shown in Fig. 5, the total clearance is 72. This falls in the range of '$CLt \geq 61 \times k$' to which the guideline of '300 mg for single dose at 12 hr interval' is applicable. Since this total clearance is determined with allowance made for the failure of renal function and blood filtering of the treated patient who is seriously ill, the physician can properly and promptly administer the drug to the patient by referring to the guidelines on this drug administration support screen 24.

[50] The present invention is not limited to the above embodiments, but may take various modifications and variations. For example, the numerical data and name of materials cited with respect to the above embodiments are mentioned only for illustrative purposes, and they can be varied in widely different manners. The layout of each screen is not limited to the illustrated configuration, but may be changed as appropriate according to a given purpose.

[51] The above embodiments have been described on the assumption that the renal excretion of a drug is represented by the renal clearance of the drug, but according to the invention if the drug is mainly excreted from the liver, the hepatic clearance may be employed instead of the renal clearance.

[52] The above embodiments have been described on the assumption that the patient is on CHP. But the system of the invention may be applied in the same manner to the patient who is receiving intermittent hemofiltration.

[53] The drug administration support system representing an embodiment of the invention has been described on the assumption that the system is a data-processing device. But the system may be configured as software for supporting drug administration. For example, a program for supporting drug administration according to the invention is stored in a ROM, such that the inventive drug administration support system can be practiced by letting the CPU of a computer read the program from the ROM to put it into practice. Alternatively, the program may be stored in a recording medium readable to a computer, such that the computer can fetch the program from the recording medium and register it to its RAM to put it into practice. In any of the cases described above, the same effects and advantages as those observed in the above embodiments will be ensured.

Claims

[1] A drug administration support system comprising:
storing means for storing blood filtering information, biological information and drug information;
calculating means for calculating a total clearance of the drug with due consideration paid to the renal function failure and blood filtering on the basis of the blood filtering information, biological information, and drug information; and
displaying means for displaying the obtained total clearance.

[2] A drug administration support system as claimed in claim 1, wherein said calculating means calculates the total clearance of the drug by the following formula:
$CLt=k \times CLcr+(1-T/100) \times Qw \times (1-f/100)+CLa$
where CLt(ml/min) represents a total clearance during the blood filtering, k and T are constants different for individual drugs, k represents a coefficient for converting from the creatinine clearance to the drug clearance, T represents a protein binding rate of the drug, Qw(ml/min) is the set value in the blood filtering, CLcr(ml/min) represents a renal creatinine clearance, f represents a filter clogging removal efficiency reduction index, and CLa(ml/min) represents a clearance of absorbing the drug to the blood filter.

[3] A drug administration support system as claimed in claim 2, wherein the renal creatinine clearance is calculated from a serum creatinine concentration by the following formula:
$CLcr=[BW \times (140-Y)/(72 \times Cr)] \times M$
where BW(kg) represents body weight, Y(y.o.) represents an age, Cr(mg/dl) represents a serum creatinine concentration, and M(mg/dl) represents a coefficient (male:1, female:0.85).

[4] A drug administration support system as claimed in any one of claims 1 to 3, wherein the total clearance of the drug is the sum of the renal clearance of the drug and the blood filtering clearance of the drug.

[5] A drug administration support system as claimed in any one of claims 1 to 4, wherein said displaying means displays a guideline by a level bar as the indication of the renal creatinine clearance.

[6] A drug administration support system as claimed in any one of claims 1 to 5, wherein said drug is the renal secretion drug.

[7] A program operable in a computer, the program comprising the steps of:
extracting stored blood filtering information, biological information and drug information from a memory; and

calculating a total clearance of the drug with due consideration paid to the renal function failure and blood filtering on the basis of the blood filtering information, biological information, and drug information.